

## Experiment 949 update

Strategy to complete Beam Background.

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### Abstract

Problems with the second half the data due to the addition of the  $\overline{C_\pi} + ps16$  may make the beam background the largest measured background (true value smaller, but unable to measure due to lack of statistics) in the PNN2 analysis. Attempts are being made to determine a method that will get a measured central value closer to the true background value.

## 1 Introduction

## 2 Outstanding Questions

- **1-BM Normalization: Why does the Bifurcated method not match the non-bifurcated method for PNN2?**

I would like to side step this issue. If we are able to get an acceptable measurement with the non-bifurcated technique, then that should be fine. This question would only have to be answered if we are intending to use the number extracted from the bifurcated method. If we are intending to use the bifurcated method and the measured value is not constant with the non-bifurcated method then we may have correlations that we are not expecting or some other reason causes the bifurcated method to fail.

However, the reverse is not true. We do not have to worry about the non-bifurcated not satisfying some assumption or breaking down at some point. Also, the non-bifurcated method was what was used in the E787-PNN2 analysis.

- **With PNN1 data if we apply  $\overline{targf}$  in the 2-BM rejection measurement, the rejection value increases by a factor of 1.8 (6 remaining events w/o  $\overline{targf}$  become 2 events with  $\overline{targf}$  applied). Why does this happen? PNN1 shouldn't be sensitive to this?**

I looked at these 6 events, see following paw photo plots. Events 93606 and 18858 are the two events that pass all cuts in addition to the  $\overline{targf}$  cut in the 2-BM rejection branch. The other four events pass all other cuts to remain at the end of the bifurcation. The two  $\overline{targf}$  events visually are 2-BM background events. Of the other four events, event 190233 does not appear visually to be a 2-BM background. Event 82248 seems to be a "KIC event" as reported in k034 page 149.

So at least in the PNN1 sample of events, when we invert the  $\overline{targf}$  cut we see that we obtain a cleaner set of 2-Beam events. However, I will need to visually scan a similar set of PNN2 events to see if this hold true in the lower momentum region.

2006/06/30 08.31

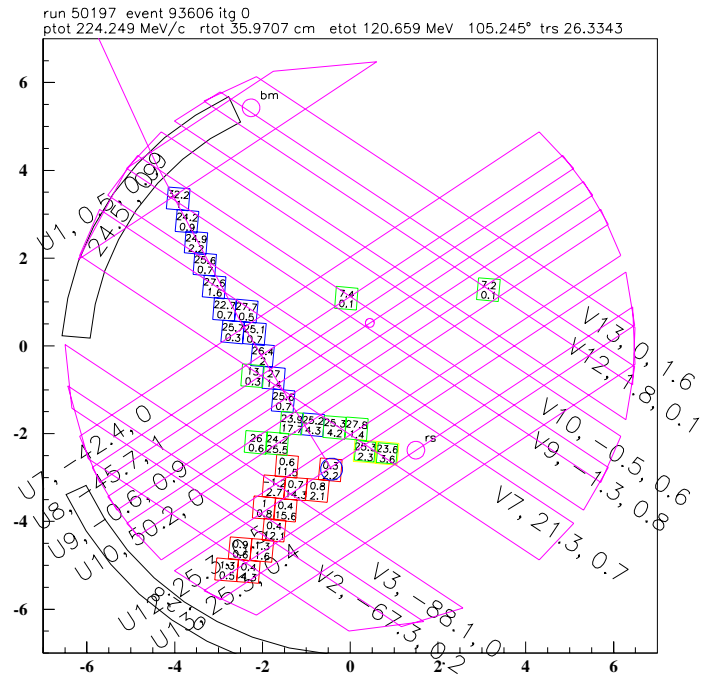


Figure 1: event 93606

2006/06/30 08.46

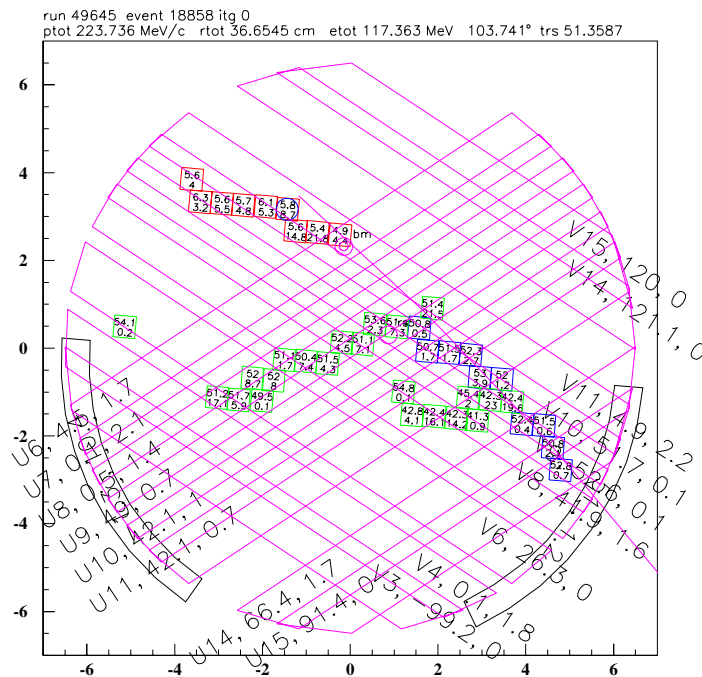


Figure 2: event 18858

2006/06/30 08.40

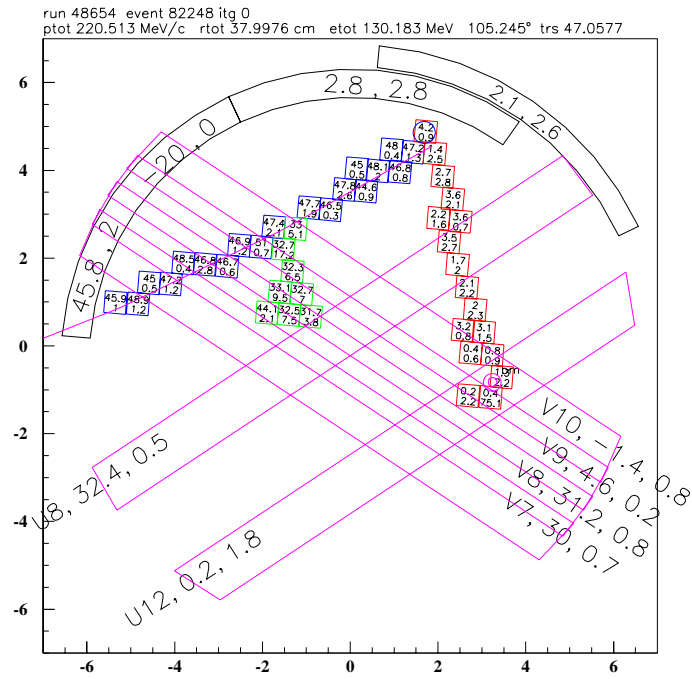


Figure 3: event 82248

2006/06/30 08.40

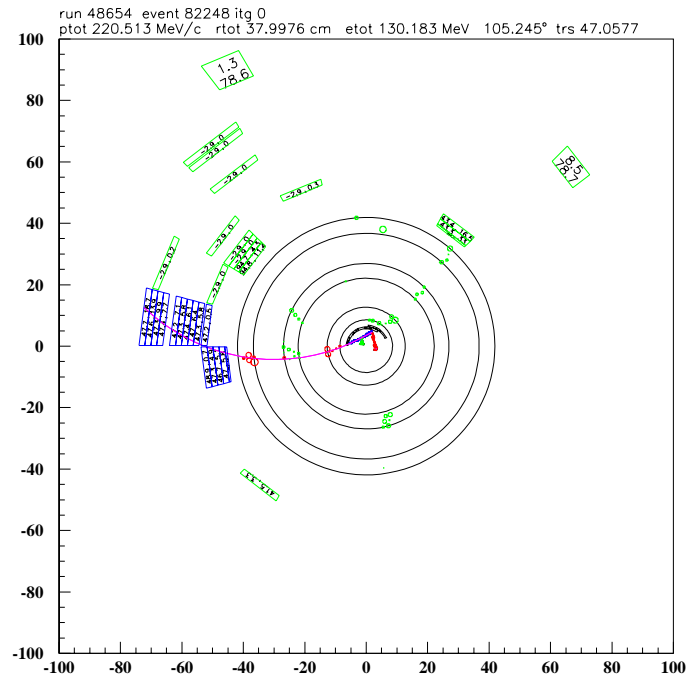


Figure 4: event 82248

2006/06/30 08.26

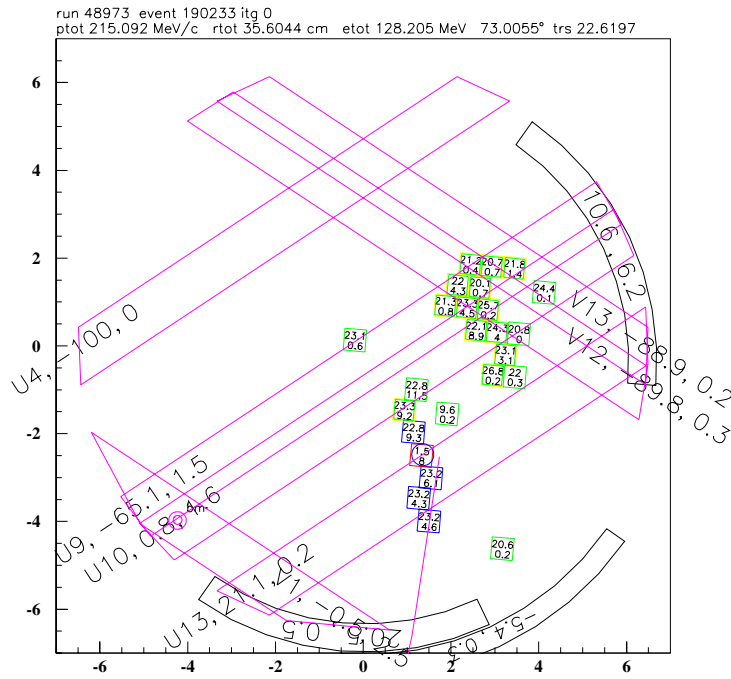


Figure 5: event 190233

2006/06/29 13.45

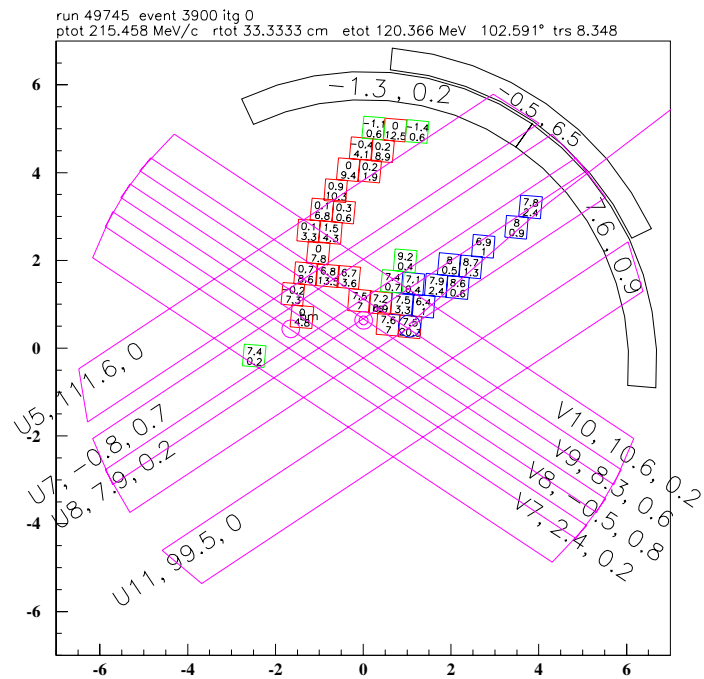


Figure 6: event 3900

```
run 50129 event 218121 itg 0
ptot 222.198 MeV/c rtot 37.8266 cm etot 112.674 MeV 63.9658° trs 8.348
```

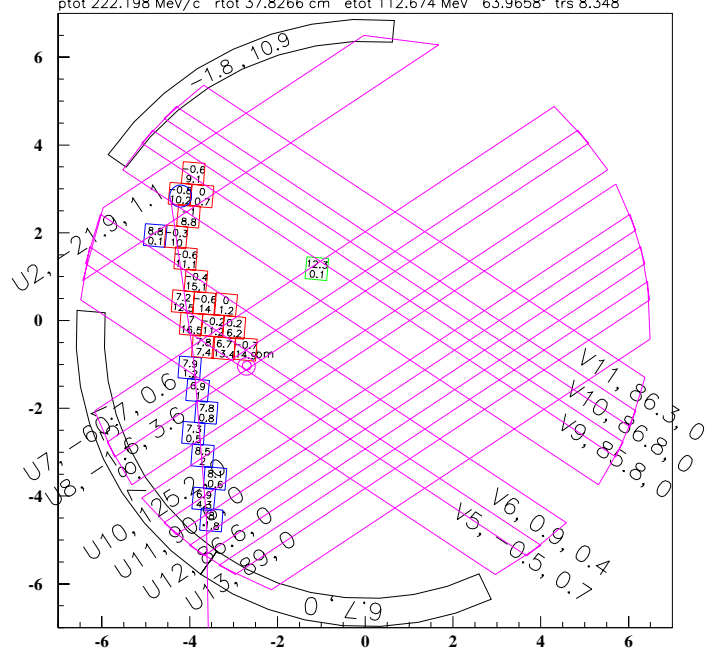


Figure 7: event 218121

- **Explain the 2-Beam Normalization structure?**

For example, in the K-pi branch we further bifurcate the structure into the normalization (n) (B4TRS\*B4CCD) and the rejection (r) (TG\*TGKIN\*TGPV) and then obtain the overall normalization (N) by  $N = n/(r - 1)$ . Is this correct? We are not inverting any cuts as is done in the 1-Beam Normalization.

- **We have a problem measuring the 2-Beam Background? What are we going to do about that?**
  - Remove TG-scatter cuts in the normalization to obtain more statistics
  - Understand differences in the 1st half of data between PNN1 and PNN2. If we understand differences, then extrapolate PNN1's value to measure the 2nd half of PNN2
- **Why is the PNN2 K-K background  $\times 200$  greater than the PNN1 K-K background**
- **Why is the PNN2 K-pi background  $\times 40$  greater (1st half of data, before trigger change) than the PNN1 K-pi background**

Understand what cuts are making the difference.

- **more?**

### 3 Conclusions

Lots of work to do.